3A NODE1/PMA1 SHELL WARM-UP

1. DOCUMENT HEATER POWER ALLOCATION FOR WARM UP

NOTE
The heater power allocation recorded in this step is the total power available to the US segment minus the current housekeeping power.

√**MCC** for heater power allocation

Record heater power allocation: _____ W

2. VERIFY PMA 1 AND NODE 1 HEATERS INHIBITED

NODE1: TCS

√PMA1 HtrA,B Availblty (eight) - Inh
√Nod1 HtrA,B Availblty (eighteen) - Inh

3. NODE 1/PMA 1 SHELL HEATER PRIORITIZATION

NOTE

Node1 and PMA1 heaters are reconfigured at four hour intervals based on shell temperature and heater power allocation. The coldest areas of the PMA 1 or Node 1 shell will be given the highest priority when heaters are enabled. Heater availability will be commanded to "Enabled to Operate" in priority order, starting with the PMA 1 or Node 1 heater control zone with the coldest temperature.

Rank Node 1 and PMA 1 shell heaters from coldest to warmest using the temperature sensor(s) associated with each heater.

Record the heater priority in Table TBD1.

In the priority order documented in Table TBD1, select a group of heaters that can be commanded to the "Enabled to Operate" state within the heater power allocation recorded in Step 1.

NOTE

If a given heater will cause the total heater power to exceed the power allocation documented in Step 1 then that heater should be skipped and the next heater in priority order should be compared to the power allocation. All PMA 1 and Node 1 shell heaters should be evaluated in priority order.

Document in Table TBD2 the group of heaters to be enabled.

4. INHIBIT PMA 1 AND NODE 1 HEATERS NOT SELECTED FOR WARMUP

NOTE

This step inhibits Node 1 and PMA 1 shell heaters which were used in the previous four hours of the warm up but were not selected for the next four hour warm up period. When Step 4 is executed for the first time, all heaters will already be Inhibited.

If any PMA1(Node1) Htr[X]A(B) **not** included in Table TBD2 is Ena Opr

sel PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel cmd PMA1 (Node1) Htr[X]A(B) - Inhibit

√PMA1(Nod1) Htr[X]A(B) Availability - Inh

Repeat

5. ENABLE PMA 1 AND NODE 1 HEATERS SELECTED FOR WARMUP

NOTE

This step Enables Node 1 and PMA 1 shell heaters which were not used in the previous four hours of the warm up but will be used in the next four hour warm up period. When Step 5 is executed for the first time, all heaters will already be Inhibited.

If any PMA1(Node1) Htr[X]A(B) included in Table TBD2 is Inh

sel PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel cmd PMA1 (Node1) Htr[X]A(B) - Ena Operate

√PMA1(Nod1) Htr[X]A(B) Availability - Ena Opr

Repeat

Wait 4 hours and repeat Steps 2 - 5 until all Node1 and PMA1 shell temperatures are ≥ 18 °C.

6. INHIBIT A HEATERS AND ENABLE TO OPERATE B HEATERS FOR NODE 1/PMA 1 SHELL TEMPERATURE MAINTENANCE

NOTE

Step 6 should be executed only after all PMA 1 and Node 1 shell temperatures are ≥ 18 °C.

If any PMA1(NODE1) Htr[X]A **not** Inh

sel PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel cmd PMA1 (Node1) Htr[X]A(B) - Inhibit

√PMA1(Nod1) Htr[X]A(B) Availability - Inh

Repeat

If any PMA1(NODE1) Htr[X]A **not** Ena Opr

sel PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

PMA1 Htr (Node1 Htr 1-6) (Node 1 Htr 7-9) Availability

sel cmd PMA1 (Node1) Htr[X]A(B) - Ena Operate

√PMA1(Node1) Htr[X]A(B) Availability - Ena Opr

Repeat

NOTE

The final configuration for PMA 1 and Node 1 heaters is provided in Table 3. The setpoints and failure limits for each temperature sensor are not changed in this procedure and are provided in Table 3 for reference only.

TABLE 3 - PMA1 / NODE1 HEATER CONFIGURATION TABLE

NODE 1/PMA 1 WARM UP

PMA 1 HEATERS

HEATER	AVAIL-ABILITY	UPPER SETPOINT	FAILURE UPPER LIMIT	LOWER SETPOINT	FAILURE LOWER LIMIT	CYCLIC LOAD DELTA
1A	Inh	21	45	18	-18	0
1B	Ena Opr	21	45	18	-18	0
2B	Ena Opr	21	45	18	-18	0
3A	Inh	21	45	18	-18	0
3B	Ena Opr	21	45	18	-18	0
4A	Inh	21	45	18	-18	0
5A	Inh	21	45	18	-18	0
5B	Ena Opr	21	45	18	-18	0

NODE 1 HEATERS

HEATER (SENSOR)	AVAIL-ABILITY	UPPER SETPOINT	FAILURE UPPER LIMIT	LOWER SETPOINT	FAILURE LOWER LIMIT	CYCLIC LOAD DELTA
1A (Snsr 1)	Inh	21	45	18	-18	0
1A (Snsr 2)		21	45	18	-18	0
1B (Snsr 1)	Ena Opr	21	45	18	-18	0
1B (Snsr 2)		21	45	18	-18	0
2A	Inh	21	45	18	-18	0
2B	Ena Opr	21	45	18	-18	0
3A (Snsr 1)	Inh	21	45	18	-18	0
3A (Snsr 2)		21	45	18	-18	0
3B (Snsr 1)	Ena Opr	21	45	18	-18	0
3B (Snsr 2)		21	45	18	-18	0
4A	Inh	21	45	18	-18	0
4B	Ena Opr	21	45	18	-18	0
5A (Snsr 1)	Inh	21	45	18	-18	0
5A (Snsr 2)		21	45	18	-18	0
5B (Snsr 1)	Ena Opr	21	45	18	-18	0
5B (Snsr 2)		21	45	18	-18	0
6A (Snsr 1)	Inh	21	45	18	-18	0
6A (Snsr 2)		21	45	18	-18	0
6B (Snsr 1)	Ena Opr	21	45	18	-18	0
6B (snsr 2)		21	45	18	-18	0
7A(Snsr 1)	Inh	21	45	18	-18	0
7A (Snsr 2)		21	45	18	-18	0
7B (Snsr 1)	Ena Opr	21	45	18	-18	0
7B (Snsr 2)		21	45	18	-18	0
8A	Inh	21	45	18	-18	0
8B	Ena Opr	21	45	18	-18	0
9A	Inh	21	45	18	-18	0
9B	Inh	21	45	18	-18	0